

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A stereoscopic image data structure for a stereoscopic display device that displays a stereoscopic image, with parallaxes being given in a horizontal direction but not given in a vertical direction,

the stereoscopic display device comprising:

a display unit that has having a display face on which a parallax interleaved image for stereoscopic display is displayed, with pixels being arranged with a first horizontal pitch in the horizontal direction; and

~~a parallax barrier that has light control unit linear optical apertures~~ disposed to face the display face, ~~and the light control unit having optical apertures arranged with a~~ second horizontal pitch in the horizontal direction, the optical apertures inclined from the vertical direction, the second horizontal pitch being equal to n times (n being an integer number) an integral multiple (n) of the first horizontal pitch, the ~~parallax barrier light control unit directing-controlling directions of~~ light rays emitted from pixels at horizontal intervals of n pixels as parallel light rays toward a viewing zone the display unit,

the stereoscopic image data structure comprising: a parallax component image data representing n or more parallax component images, each having accumulated pixels that cause the pixels to generate parallel light rays in the same a respective parallax direction in the a viewing zone, and each having a different numbers number of horizontal pixels,

wherein the parallax interleaved image is formed by combining n combined images, each combined image having a same number of vertical pixels as the number of horizontal pixels,

~~wherein each combined image is n-combined images with the same numbers of vertical and horizontal pixels are a unit to be converted into a parallax interleaved image, the n-combined images being formed by combining one or more parallax component images with parallax directions different from each other by n.~~

2. (Currently Amended) A method of recording stereoscopic image data for a stereoscopic display device that displays a stereoscopic image, with parallaxes being given in a horizontal direction but not given in a vertical direction,

the stereoscopic display device including:

a display unit ~~that has~~ having a display face on which a parallax interleaved image for stereoscopic display is displayed, with pixels being arranged with a first horizontal pitch in the horizontal direction; and

~~a parallax barrier that has linear optical apertures~~ light control unit disposed to face the display face, ~~and the light control unit having optical apertures~~ arranged with a second horizontal pitch in the horizontal direction, the optical apertures inclined from the vertical direction, the second horizontal pitch being equal to n times (n being an integer number) an integer multiple (n) of the first horizontal pitch, the parallax barrier light control unit directing controlling directions of light rays emitted from pixels at horizontal intervals of n pixels as parallel light rays toward a viewing zone the display unit,

the method comprising:

preparing a parallax component image data representing n or more parallax component images, each having accumulated pixels that cause the pixels to generate parallel light rays in the same a respective parallax direction in the a viewing zone, and each having a different numbers number of horizontal pixels; and

recording n combined images, each combined image having a same number of vertical pixels as the number of horizontal pixels, and each square image n -combined-
images with the same numbers of vertical and horizontal pixels as a unit to be-
converted into a parallax interleaved image, the n -combined images being formed by
combining one or more parallax component images with parallax directions different from each other by n .

3. (Currently Amended) The method of recording stereoscopic image data as claimed in claim 2, wherein:

each of the combined images is a parallelogram; and
the image data corresponding to one of the linear optical apertures is aligned in a vertical line in the combined images.

4. (Original) The method of recording stereoscopic image data as claimed in claim 2, wherein

each of the combined images has parallax component images stacked in m stages, each of the parallax component images having a vertical resolution that is $1/m$ of a horizontal resolution.

5. (Original) The method of recording stereoscopic image data as claimed in claim 2, wherein each of the parallax component images are formed by perspective projection in vertical direction according to the predetermined viewing distance and by orthographic projection in horizontal direction.

6. (Original) The method of recording stereoscopic image data as claimed in claim 2, wherein each of the parallax component images are formed by perspective projection according to the predetermined viewing distance.

7. (Original) The method of recording stereoscopic image data as claimed in claim 2, wherein the n combined images are further combined so as to form an ultimate combined image to be recorded.

8. (Original) The method of recording stereoscopic image data as claimed in claim 7, wherein the ultimate combined image is formed by combining the combined images in such a manner that the combined images having adjacent parallax directions are adjacent to one another in the horizontal direction.

9. (Previously Presented) The method of recording stereoscopic image data as claimed in claim 8, wherein:

the ultimate combined image is formed by combining the combined images in such a manner that the combined images having adjacent parallax directions are adjacent to one another in the horizontal direction; and

two combined images having the parallax directions at both ends of the n parallax direction close to the front face of the display face are disposed at both ends of the ultimate combined image.

10. (Previously Presented) The method of recording stereoscopic image data as claimed in claim 7, wherein the ultimate combined image is formed by combining the combined images in the horizontal direction and the vertical direction, so as to form a tile-like format.

11. (Previously Presented) The method of recording stereoscopic image data as claimed in claim 7, wherein the ultimate combined image has the same numbers of vertical and horizontal pixels as those of the parallax interleaved image displayed on the display face at the time of stereoscopic display.

12. (Original) The method of recording stereoscopic image data as claimed in claim 7, wherein the ultimate combined image is formed as a rectangular-parallelepiped ray space defined by a ray space method.

13. (Previously Presented) The method of recording stereoscopic image data as claimed in claim 7, wherein the combined images or the ultimate combined image is irreversibly compressed and then recorded.

14. (Currently Amended) A reproducing method for a stereoscopic image, with parallaxes being given in a horizontal direction but not given in a vertical direction, the stereoscopic display device including:

a display unit that has having a display face on which a parallax interleaved image for stereoscopic display is displayed, with pixels being arranged with a first horizontal pitch in the horizontal direction; and

~~a parallax barrier that has light control unit linear optical apertures disposed to face the display face, and the light control unit having optical apertures arranged with a second horizontal pitch in the horizontal direction, the optical apertures inclined from the vertical direction, the second horizontal pitch being equal to n times (n being an integer number) an integer multiple (n) of the first horizontal pitch, the parallax barrier light control unit directing-controlling directions of light rays emitted from pixels at horizontal intervals of n pixels as parallel light rays toward a viewing zone the display unit,~~

the method comprising:

preparing a parallax component image data representing n or more parallax component images, each having accumulated pixels that cause the pixels to generate parallel light rays in ~~the same~~ a respective parallax direction in the a viewing zone, and each having a different numbers number of horizontal pixels;

recording n combined images, each combined image having a same number of vertical pixels as the number of horizontal pixels, and each square image n-combined-
~~images with the same numbers of vertical and horizontal pixels, the n-combined images~~
being formed by combining one or more parallax component images with parallax directions different from each other by n; and

displaying a parallax interleaved image on the display face after converting the n combined images into the parallax interleaved image.

15. (Original) The reproducing method for a stereoscopic image as claimed in claim 14, wherein:

each of the combined images is a rectangular having the same aspect ratio as the parallax interleaved image; and

the conversion into the parallax interleaved image involves generation of pixel data of the parallax interleaved image through an interpolating process based on one or more pixels adjacent to each other in the horizontal direction in the combined images.

16. (Currently Amended) A reproducing method of a stereoscopic image, with parallaxes being given in a horizontal direction but not given in a vertical direction,

the stereoscopic display device including:

a display unit ~~that has~~ having a display face on which a parallax interleaved image for stereoscopic display is displayed, with pixels being arranged with a first horizontal pitch in the horizontal direction; and

~~a parallax barrier that has~~ light control unit ~~linear optical apertures~~ disposed to face the display face, ~~and the light control unit having optical apertures~~ arranged with a second horizontal pitch in the horizontal direction, the optical apertures inclined from the vertical direction, the second horizontal pitch being equal to n times (n being an integer number) an integer multiple (n) of the first horizontal pitch, the ~~parallax barrier~~ light

~~control unit directing controlling directions of light rays emitted from pixels at horizontal intervals of n pixels as parallel light rays toward a viewing zone~~ the display unit,

the method comprising:

preparing a parallax component image data representing n or more parallax component images, each having accumulated pixels that cause the pixels to generate parallel light rays in ~~the same~~ a respective parallax direction in ~~the~~ a viewing zone, and each having a different ~~numbers~~ number of horizontal pixels;

recording an ultimate combined image that is formed by combining n combined images, each combined image having ~~the a same numbers~~ number of vertical and horizontal pixels, the n combined images being formed by combining one or more parallax component images with parallax directions different from each other by n; and

displaying a parallax interleaved image on the display face after converting the ultimate combined image into the parallax interleaved image.

17. (Original) The reproducing method for a stereoscopic image as claimed in claim 16, wherein:

each of the combined images is a rectangular having the same aspect ratio as the parallax interleaved image; and

the conversion into the parallax interleaved image involves generation of pixel data of the parallax interleaved image through an interpolating process based on one or more pixels adjacent to each other in the horizontal direction in the combined images.

18. (Currently Amended) A non-transitory computer-readable medium including a computer-executable program for recording stereoscopic image data for a stereoscopic display device that displays a stereoscopic image, with parallaxes being given in a horizontal direction but not given in a vertical direction,

the program comprising instructions for:

preparing a parallax component image data representing n or more parallax component images, each having accumulated pixels that cause the pixels to generate parallel light rays in ~~the same~~ a respective parallax direction in a viewing zone, and each having a different ~~numbers~~ number of horizontal pixels; and

recording n combined images, each combined image having with the a same ~~numbers~~ number of vertical and horizontal pixels, the n combined images being formed by combining one or more parallax component images with parallax directions different from each other by n.

19. (Currently Amended) A non-transitory computer-readable medium including a computer-executable reproducing program for displaying a stereoscopic image, with parallaxes being given in a horizontal direction but not given in a vertical direction,

the program comprising instructions for:

preparing a parallax component image data representing n or more parallax component images, each having accumulated pixels that cause the pixels to generate

parallel light rays in ~~the same~~ a respective parallax direction in a viewing zone, and
each having a different ~~numbers~~ number of horizontal pixels;

recording n combined images, ~~each combined image having with the~~ a same
~~numbers~~ number of vertical and horizontal pixels, the n combined images being formed
by combining one or more parallax component images with parallax directions different
from each other by n; and

displaying a parallax interleaved image on a display unit after converting the n
combined images into the parallax interleaved image.

20. (Currently Amended) A non-transitory computer-readable medium
including a computer-executable reproducing program for displaying a stereoscopic
image, with parallaxes being given in a horizontal direction but not given in a vertical
direction,

the program comprising instructions for:

preparing a parallax component image data representing n or more parallax
component images, each having accumulated pixels that cause the pixels to generate
parallel light rays in ~~the same~~ a respective parallax direction in a viewing zone, and
each having a different ~~numbers~~ number of horizontal pixels;

recording an ultimate combined image that is formed by combining n combined
images, ~~each combined image~~ each combined image having ~~the~~ a same ~~numbers~~ number of vertical and
horizontal pixels, the n combined images being formed by combining one or more
parallax component images with parallax directions different from each other by n; and

displaying a parallax interleaved image on a display unit after converting the
ultimate combined image into the parallax interleaved image.